GPS AutoSteer System
Installation Manual

Supported Vehicles

CNH

Case Puma Accuguide	New Holland Intellisteer
165	T7030
180	T7040
195	T7050
210	T7060
255	

PN: 602-0229-01-A

LEGAL DISCLAIMER

Note: Read and follow ALL instructions in this manual carefully before installing or operating the AutoSteer system.

Note: Take careful note of the safety information in the Safety Information section and throughout this manual.

The manufacturer disclaims any liability for damage or injury that results from failure to follow the instructions and warnings set forth herein.

Please take special note of the following warnings:

1. There is NO obstacle avoidance system included in the manufacturer’s product. Therefore, users must always have an operator on the equipment when the AutoSteer system is in use to look for any obstacles including people, animals, trees, ditches, buildings, etc.
2. During installation of the AutoSteer system and during the Calibration and Tuning processes the vehicle's wheels turn from side to side and the vehicle moves. Be sure that all people and obstacles are clear of the vehicle before installation, calibration and tuning, or use of the AutoSteer system.
3. Use of the AutoSteer system is NOT permitted while the vehicle is on public roads or in public areas. Ensure that the system is OFF before driving on roads or in public areas.

Special Requirements

Tools

This list consists of the tools required to complete the installation. The installer is assumed to have a complete set of common installation tools.

Flat screwdriver	3/8” open wrench	10mm open wrench
#1 Phillips screwdriver	1/2” open wrench	15mm open wrench
#2 Phillips screwdriver	9/16” open wrench	17mm open wrench
#2 Phillips stubby screwdriver	3/4” open wrench	21mm open wrench
Pliers	13/16” open wrench	24mm open wrench
9/16” socket and ratchet	7/8” open wrench	17mm socket and ratchet
15/16” socket and ratchet	15/16” open wrench	21mm socket and ratchet
10mm socket and ratchet	1/8” Allen wrench	Wire cutter small
19mm socket and ratchet	5/32” Allen wrench	Hack saw
Oil catch pan	Cleaning brush	Cleaning rags
Cable puller pole	10 ft (3 meter) ladder	Tape measure (12ft minimum)

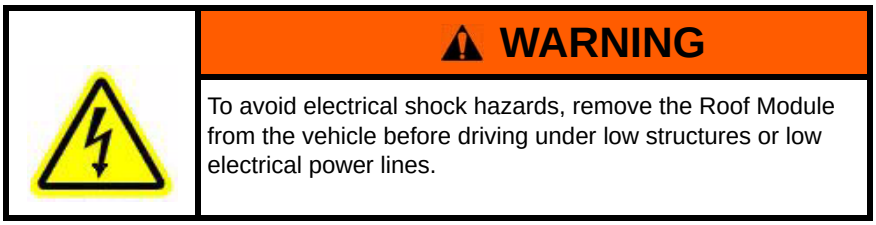
Safety Information

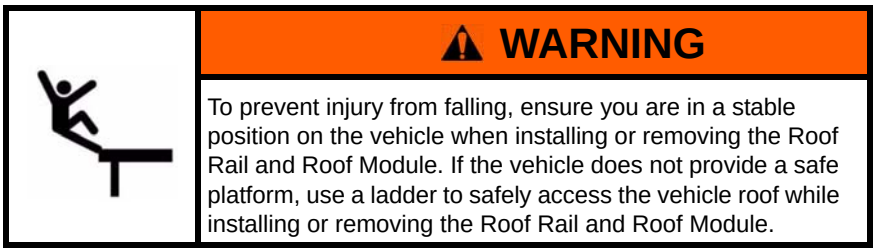
Warning Alerts

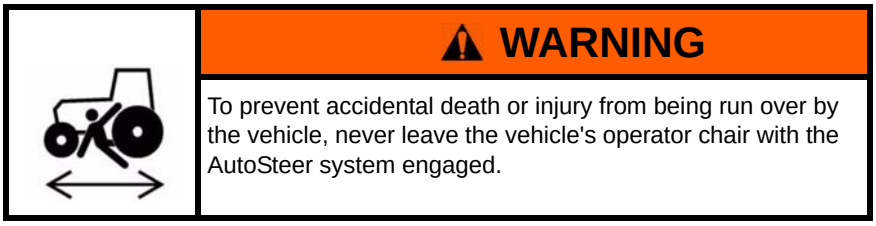
The AutoSteer system installer and manufacturer disclaim any responsibility for damage or physical harm caused by failure to adhere to the following safety requirements:

- As the operator of the vehicle, you are responsible for its safe operation.
- The AutoSteer system is *not* designed to replace the vehicle's operator.

Note: Verify all screws, bolts, nuts, and cable connections are tight after the final installation of the AutoSteer system on the vehicle.


⚠ WARNING
To avoid electrical shock hazards, remove the Roof Module from the vehicle before driving under low structures or low electrical power lines.


⚠ WARNING
To prevent injury from falling, ensure you are in a stable position on the vehicle when installing or removing the Roof Rail and Roof Module. If the vehicle does not provide a safe platform, use a ladder to safely access the vehicle roof while installing or removing the Roof Rail and Roof Module.


⚠ WARNING
To prevent accidental death or injury from being run over by the vehicle, never leave the vehicle's operator chair with the AutoSteer system engaged.

⚠ WARNING

High-Pressure Fluid Hazard

Read the Owner's Manual before installation. Wear hand and eye protection while performing hydraulic system maintenance. Relieve hydraulic system pressure before servicing the hydraulic system.

⚠ WARNING

To understand the potential hazards associated with the operation of AutoSteer system equipment read the provided documentation before installing the AutoSteer system on a vehicle.

⚠ WARNING

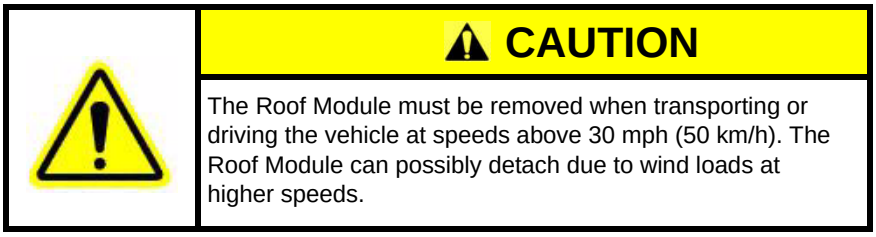
To prevent the accidental engagement of AutoSteer and loss of vehicle control while driving on roads, shut down the AutoSteer system (exit the program). Never drive on roads or in public areas with the AutoSteer system turned on.

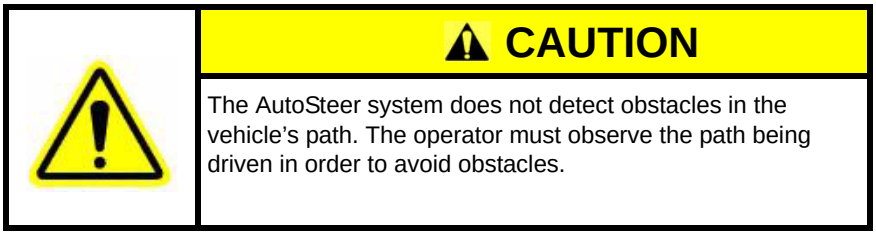
⚠ WARNING

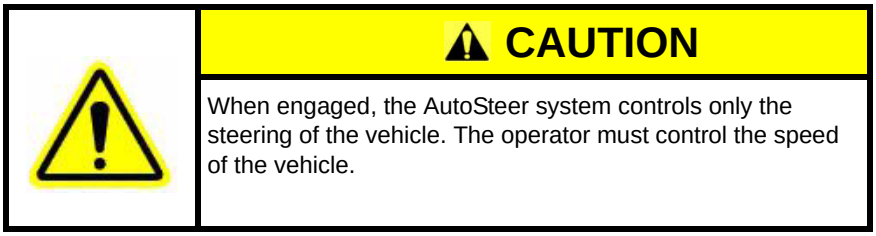
Do not stand close to the wheels and do not move the machine while you are adjusting the Relief Valve. Turn off the engine and engage the parking brake before standing under or next to the machine.

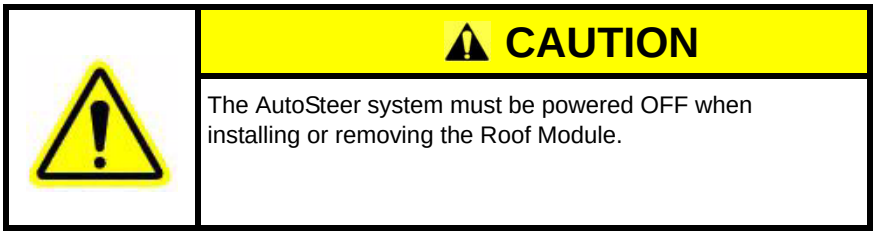
Caution Alerts

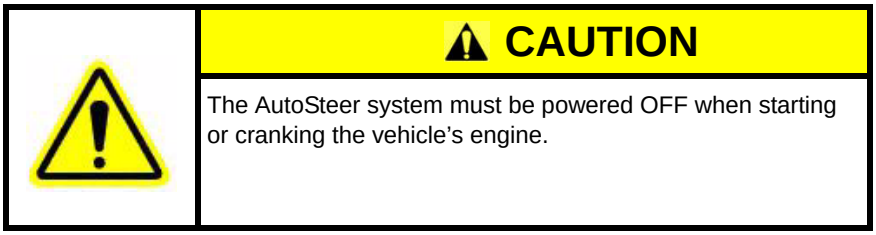
The AutoSteer system installer and manufacturer disclaim any responsibility for damage or physical harm caused by failure to adhere to the following safety requirements:

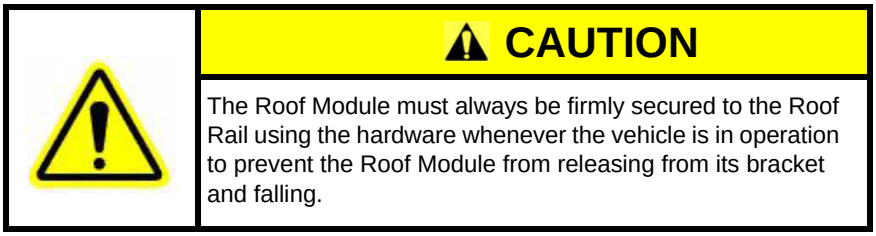

CAUTION
The Roof Module must be removed when transporting or driving the vehicle at speeds above 30 mph (50 km/h). The Roof Module can possibly detach due to wind loads at higher speeds.


CAUTION
The AutoSteer system does not detect obstacles in the vehicle's path. The operator must observe the path being driven in order to avoid obstacles.


CAUTION
When engaged, the AutoSteer system controls only the steering of the vehicle. The operator must control the speed of the vehicle.






CAUTION
The Roof Module must always be firmly secured to the Roof Rail using the hardware whenever the vehicle is in operation to prevent the Roof Module from releasing from its bracket and falling.

Vehicle Requirements

The vehicle steering system must be in good working order before installing the AutoSteer system. Check for loose or worn parts. Before installing the AutoSteer system drive the vehicle and confirm that it steers straight and the wheels can be turned from lock to lock. Check the steering system hydraulic hoses and connections to ensure there are no oil leaks.

The vehicle electrical system and battery must be in good working order.

The vehicle should be fully cleaned before installing the AutoSteer system. A clean vehicle will improve the overall installation and cable routing.

This installation kit is designed for tractors that are 'steer ready' from the factory so the tractor must be equipped with an AutoSteer valve on the Steering Orbitrol.

Important Information

Note: Verify all screws, bolts, nuts, and cable connections are tight after the final installation of the AutoSteer system on the vehicle.

Technical Support

Refer to your owner's manual for technical support information.

Contact Information

Refer to your owner's manual for contact information.

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Installation Overview

This **Installation Overview** chapter contains part numbers, kit overview diagram, cabling diagram and the installation procedure.

- *Vehicle Inspection*
- *Kit Overview*
  - *Kit Components*
  - *Roof Rail Assembly*
- *Installation Procedure Outline*
- *Cable Diagram*

This installation guide describes the installation of the AutoSteer system on several models of Case Accuguide: 165, 180, 195, 210, 255 (including continuously variable transmission (CVT) models) and New Holland Intellisteer MFWD: T7030, T7040, T7050, T7060 vehicles. The AutoSteer installation kit PN: 188-0033-01 is used on this vehicle series. The vehicle specific sub-assemblies for the vehicle series are listed in *Table 1-1*.

Vehicle Inspection

Before installing this steering system, confirm the vehicle steering system is in good working order. Drive the vehicle and verify the vehicle's correct working order. Also, ensure the following system operations and components:

- Check to see if you can turn the steered wheels from lock to lock.
- Ensure the vehicle steers straight.
- Check for loose or worn steering components.
- Ensure the hydraulic fluid level is correct.
- Service the vehicle if the steering is not in good working order.

Kit Overview

This Kit Overview section is divided into sub-sections for each of its assemblies and their components are described in the following sections.

Kit Components

This assembly is shown in *Figure 1-1* and its components are defined in *Table 1-1*.

Figure 1-1 Case Accuguide Puma Kit Components (PN: 188-0033-01)

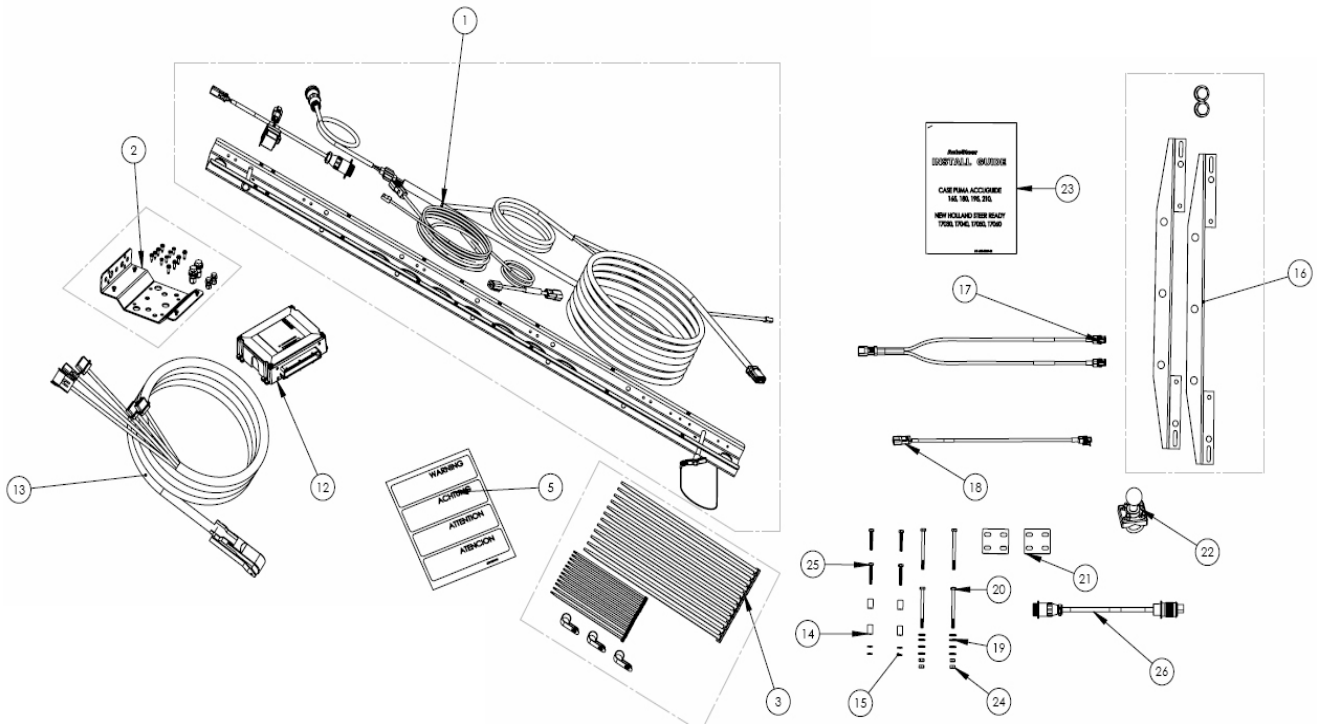


Table 1-1 Installation Kit Components (PN: 188-0033-01)

Item	Component	Part Number
1.	Common Assembly Kit	200-0497-02
2.	SA Module Bracket	200-0190-01
3.	Mounting Hardware	200-0076-01
5.	Warning Labels	603-0074-01
12.	SA Module Assembly	200-0206-01
13.	SA Module Harness	201-0351-01
14.	1/4” Spacer	521-0035-01
15.	M6 Flat Washer	517-0014-01

Item	Component	Part Number
16.	Roof Module Bracket	200-0387-01
17.	Valve Adapter Harness	201-0456-01
18.	Valve Adapter Cable	201-0457-01
19.	1/4” Flat Washer	516-0002-01
20.	1/4” Hex Bolt	512-0033-01
21.	RAM Mount Base	202-0419-01
22.	RAM Mount U-Bolt	207-0010-01
23.	Installation Guide	602-0229-01
24.	1/4” Hex Nut	518-0013-01
25.	M6x40 Bolt	513-0045-01
26.	Power Adapter Cable	201-0234-01

Roof Rail Assembly

This assembly is shown in *Figure 1-2* and its components are defined in *Table 1-2*.

Figure 1-2 Roof Rail Components (PN: 200-0497-02)

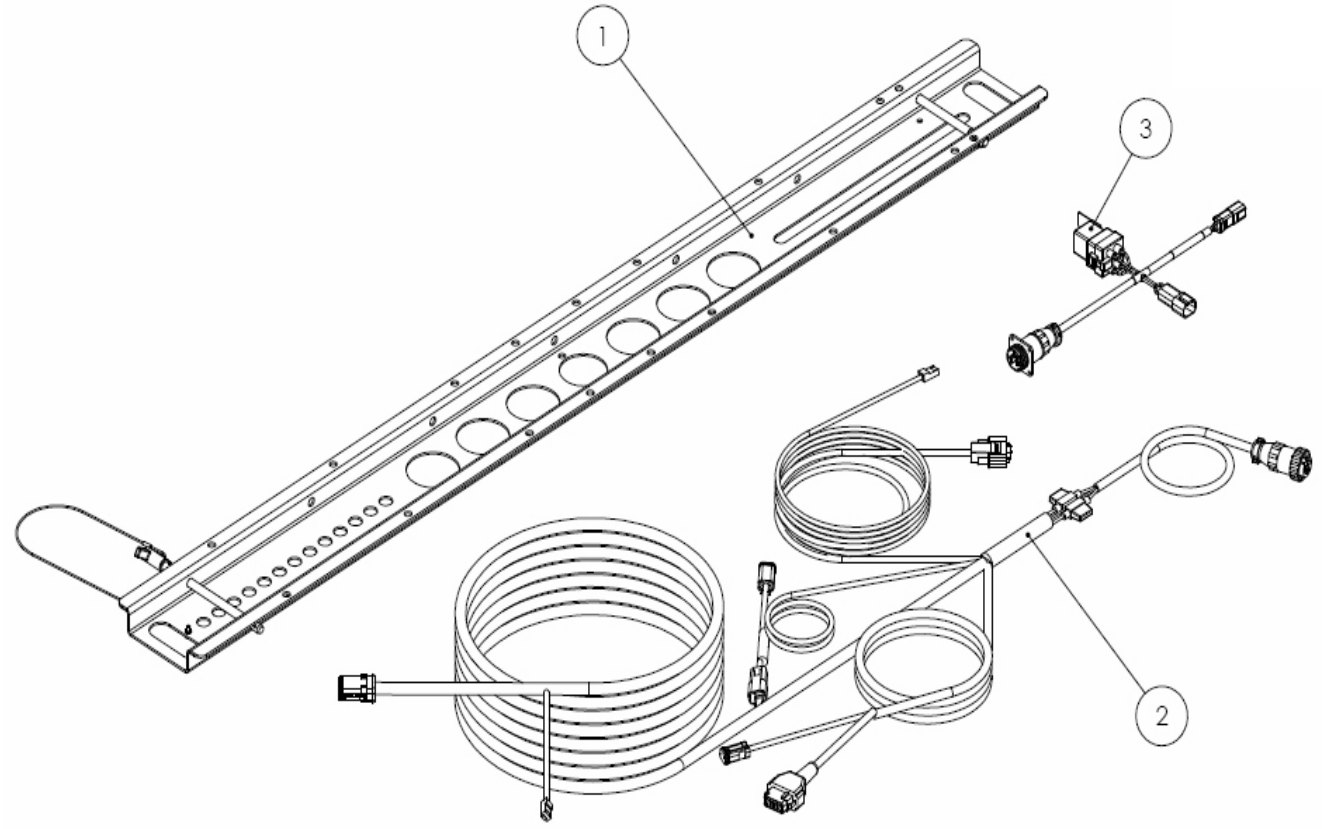


Table 1-2 Roof Rail Kit Components (PN: 200-0497-02)

Item	Component	Part Number
1.	Roof Rail Assembly	200-0515-01
2.	Main Cable Harness	201-0426-02
3.	Battery Adaptor Power Cable	201-0475-01

Installation Procedure Outline

Note: The system interconnect cable diagram in the *Cable Diagram* on page 6 section of this chapter shows the AutoSteer electrical connections.

1. Verify that all components have been received.

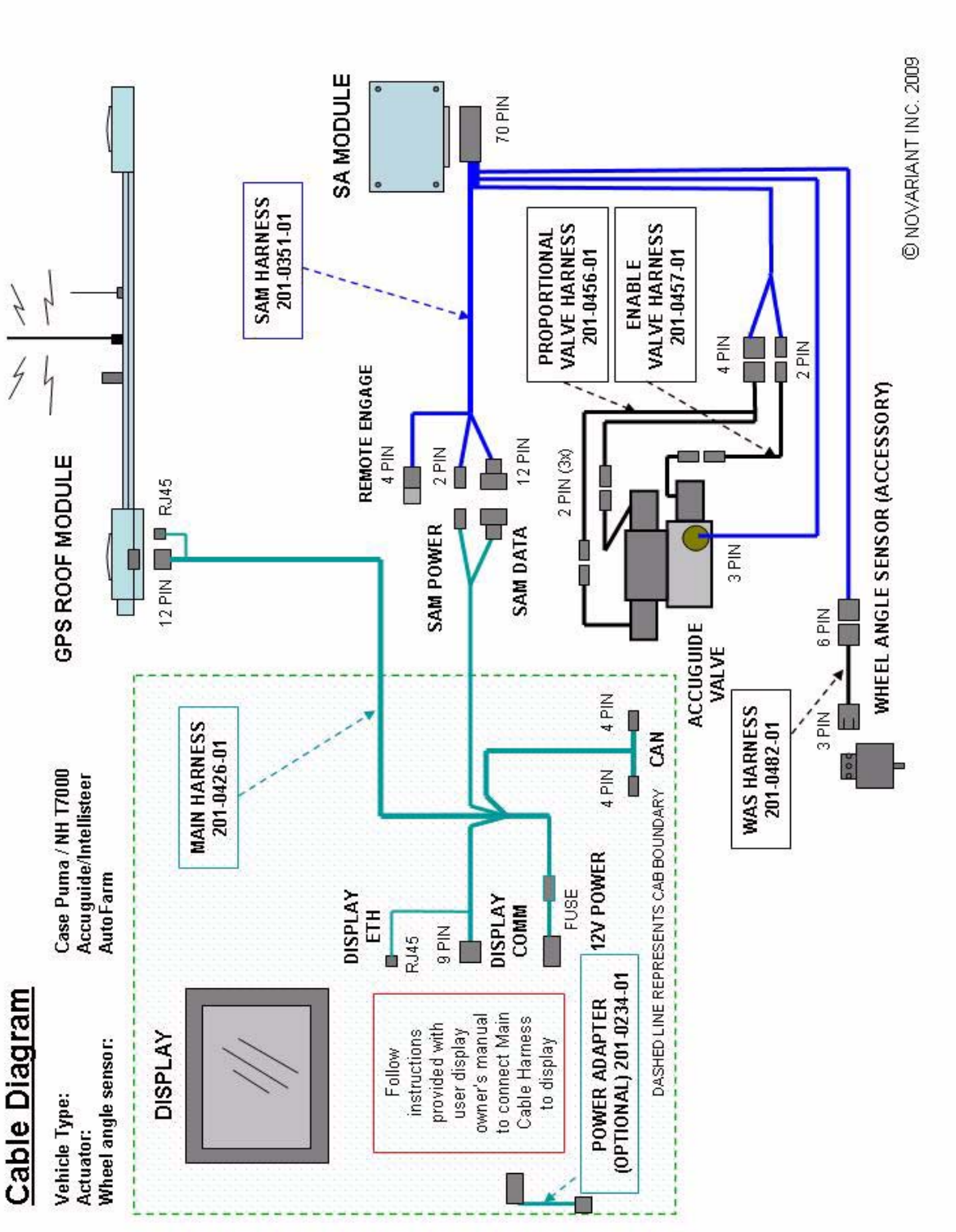
   Note: Step 2, Step 3, and Step 7 are skipped if installing an electric steering actuator.

2. Install the Wheel Angle Sensor. (Optional)
3. Install the SA Module.
4. Install the Roof Rail on the cab roof.
5. Install the Roof Module on the Roof Rail.
6. Install the Display using a RAM Mount Arm.
7. Install the SA Module Harness.
8. Install the Main Cable Harness.
9. Connect the Main Cable Harness to the Display Harness.

   Note: Instructions for connecting the vehicle kit cables to the Display can be found in the Display owner's manual.

10. Verify that all connectors are properly coupled and secured.
11. Power ON the AutoSteer system.
12. Calibrate the vehicle.
13. Tune the vehicle.
14. Verify the system has been installed properly and operates satisfactorily.

Cable Diagram



Wheel Angle Sensor (WAS) Installation

This **Wheel Angle Sensor Installation** chapter information is provided in the following sections:

- *Installing Mounting Brackets*
  - *Vehicles without Mud Flaps*
  - *Vehicles with Mud Flaps*
- *Cut the Wheel Angle Sensor Rods to Length*
- *Assemble the Linkage Rod Hardware*
- *Attach the Wheel Angle Sensor Rods to Brackets and Adjust*

Note: The Wheel Angle Sensor is optional equipment and is not provided with the installation kit. The Wheel Angle Sensor installation instructions are provided for special installations, when required.

If additional on-line performance is required, a Wheel Angle Sensor is available for this vehicle. The decision to use this option are left up to the installer and customer.

Installing Mounting Brackets

Look to see if your vehicle has mud flaps; then install the mounting brackets as follows:

- *Vehicles without Mud Flaps*
- *Vehicles with Mud Flaps*

Vehicles without Mud Flaps

1. Identify the Wheel Angle Sensor mounting location on the front right steering axle.
2. Use two spacers and two bolts to attach the Wheel Angle Sensor bracket as shown in *Figure 2-1*.

Note: The length of the spacers are 1” and 1-3/4” (the 1-3/4” is made up of a 1” and a 3/4” on top of each other) and the length of the M12 bolts is 45mm and 60mm.

Figure 2-1 Install Wheel Angle Sensor Bracket

3. Orientate the Wheel Angle Sensor as shown in *Figure 2-2*. The plug is facing the rear of the vehicle.

Figure 2-2 Wheel Angle Sensor Orientation

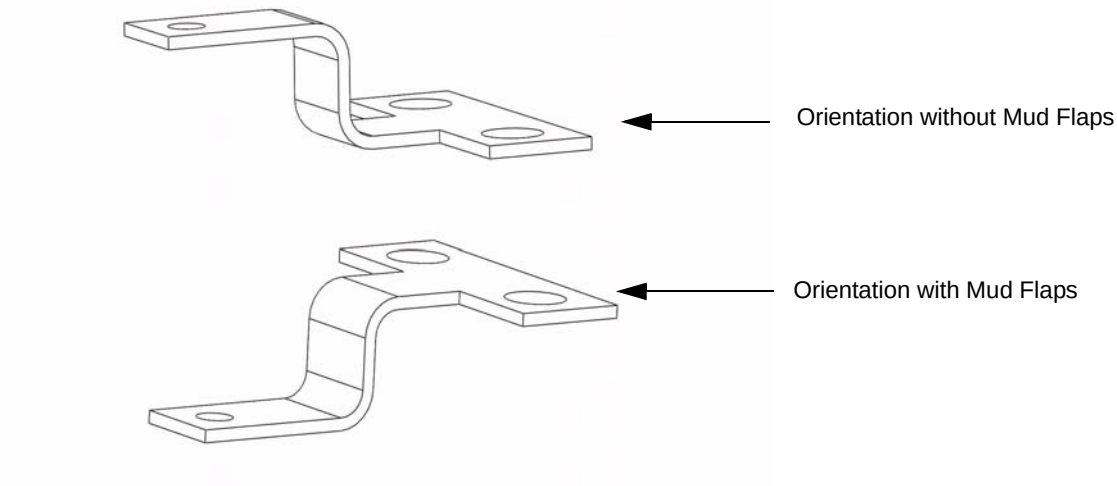
4. Secure the sensor to the bracket using a a 9/16” socket and ratchet on the two bolts provided. See *Figure 2-3*.

Figure 2-3 Wheel Angle Sensor Bracket Bolted

5. Orientate the linkage bracket as shown in *Figure 2-4*.

Note: The same bracket is used for vehicles with and without mud flaps. The top one is for use on vehicles without mud flaps and the bottom one is for use on vehicles with mud flaps.

Figure 2-4 Orient the Linkage Bracket



6. Attach the linkage bracket to the wheel hub using the two M16x20mm bolts and washers. Tighten them with a 24mm socket and ratchet. See *Figure 2-5*.

Figure 2-5 Linkage Bracket

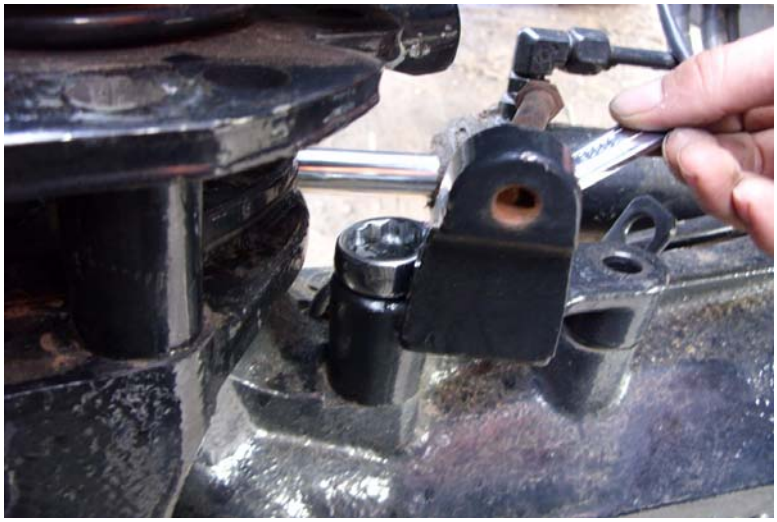
Vehicles with Mud Flaps

1. Identify the Wheel Angle Sensor mounting location on the front right steering axle. See *Figure 2-6*.

Figure 2-6 Identify Wheel Angle Sensor Mounting Location

2. Remove the two bolts from the mud flap stop using a 19mm socket and ratchet. See *Figure 2-7*.

Figure 2-7 Remove Bolts from the Mud Flap Stop



3. Attach the Wheel Angle Sensor bracket on top of the mud flap stop. Tighten them with a 19mm socket and ratchet. See *Figure 2-8*.

Note: On vehicles fitted with a suspended axle, use a 3/4” spacer in between the Wheel Angle Sensor bracket and the mud flap bracket.

Figure 2-8 Install Wheel Angle Sensor Bracket on Mud Flap Stop

4. Orientate the Wheel Angle Sensor as shown. The plug is facing the rear of the vehicle. See *Figure 2-9*.

Figure 2-9 Wheel Angle Sensor Orientation

5. Secure the sensor to the bracket using a a 9/16” socket and ratchet on the two bolts provided. See *Figure 2-10*.

Figure 2-10 Wheel Angle Sensor Bracket Bolted

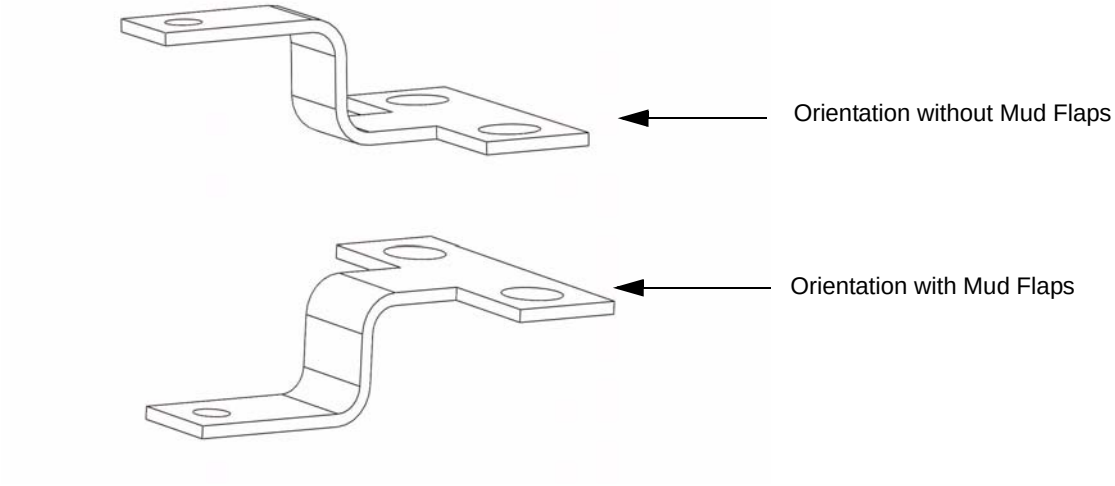
6. Remove the front two bolts that retain the mud flap using a 24mm wrench. See *Figure 2-11*.

Figure 2-11 Remove Front Bolts from the Mud Flap Stop

7. Orientate the linkage bracket as shown in *Figure 2-12*.

Note: The same bracket is used for vehicles with and without mud flaps. The top one is for use on vehicles without mud flaps and the bottom one is for use on vehicles with mud flaps.

Figure 2-12 Orient the Linkage Bracket



8. Attach the linkage bracket to the wheel hub as shown in *Figure 2-13* using the two original bolts. Tighten them with a 24mm socket and ratchet.

Figure 2-13 Linkage Bracket

Cut the Wheel Angle Sensor Rods to Length

The Wheel Angle Sensor rods are shipped longer than they need to be. These rods must be cut to the proper length to allow the linkage rods to provide the Wheel Angle Sensor the maximum number of counts as the steering wheel is turned from full right to full left. Due to the variability of the possible mounting positions and axle options, it is left to the installer to verify the correct length for each individual installation and to cut the rods to length.

Table 2-1 provides the typical rod lengths that work for most installations. Before cutting the linkage rods to these measurements, verify that the Wheel Angle Sensor brackets can attach to the vehicle as shown in this manual and that they are attached the correct distance from any reference points shown. If the axle does not allow the Wheel Angle Sensor brackets to be installed as shown, do not cut the rods until it is determined what the proper lengths are for your installation. Due to possible variations in the mounting positions, these measurements could be different. These measurements are provided as a reference only. The installer is responsible for verifying that the provided measurements will work prior to cutting the rods.

Use a metal hack saw and vice, as show in *Figure 2-15*, to cut the Wheel Angle Sensor linkage rods to the proper lengths.

Note: It is advisable to attach a nut on the side of the metal rod that is going to be kept in order to clean the threads after the cut has been made.

Protect the threads from damage while cutting the rods. *Figure 2-14* shows where the measurements provided in *Table 2-1* are measured from.

Table 2-1 Linkage Rod Cut Lengths

Item	Length
Rod A	2.18 inches (55mm)
Rod B	8.98 inches (228mm)

Figure 2-14 Linkage Rod Cut Length Measurement Points

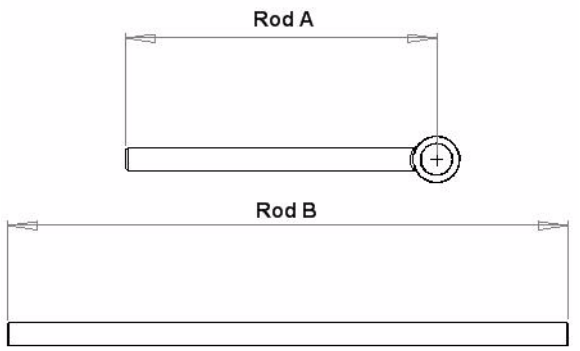
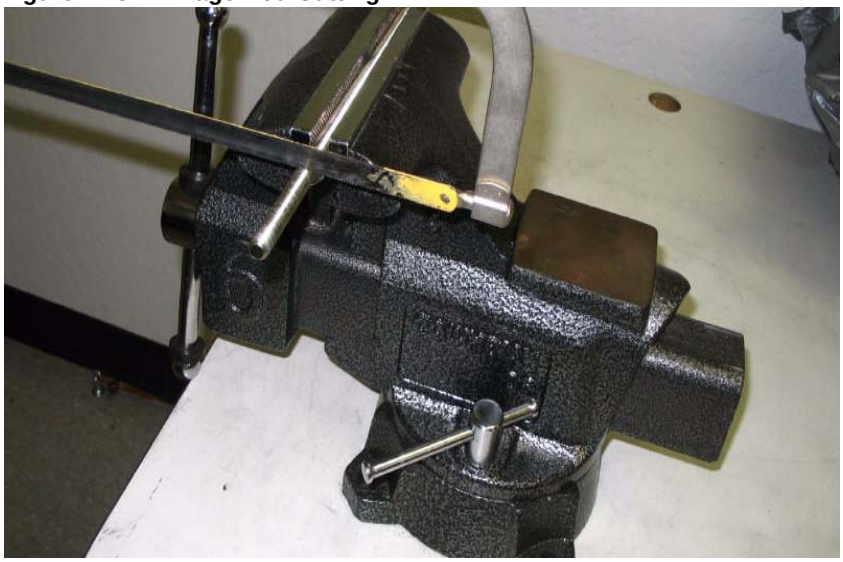


Figure 2-15 Linkage Rod Cutting



Note: The “after-assembly” center-to-center lengths of each linkage rod are shown in *Table 2-2*. *Figure 2-18* shows the measurement points for the assembled linkage rods.

Assemble the Linkage Rod Hardware

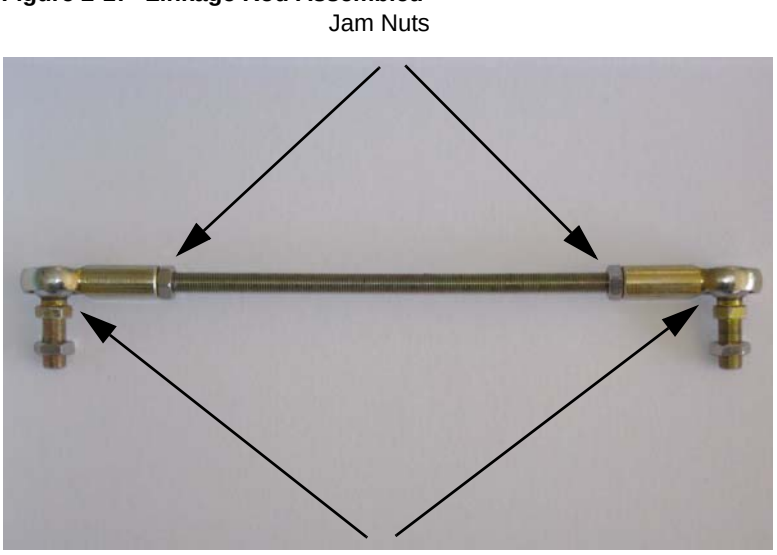
1. Attach a jam nut to the end of Rod A.
2. Connect the eye connector to the end of the Wheel Angle Sensor rod as shown in *Figure 2-16*.

Figure 2-16 Rod A Assembled

3. Attach the jam nuts to each end of the linkage Rod B.
4. Attach the ball joints to both ends of the linkage rod as shown in *Figure 2-17*.

Note: The bolts for the ball joints should be facing the same direction as shown in *Figure 2-17* for this installation.

Figure 2-17 Linkage Rod Assembled

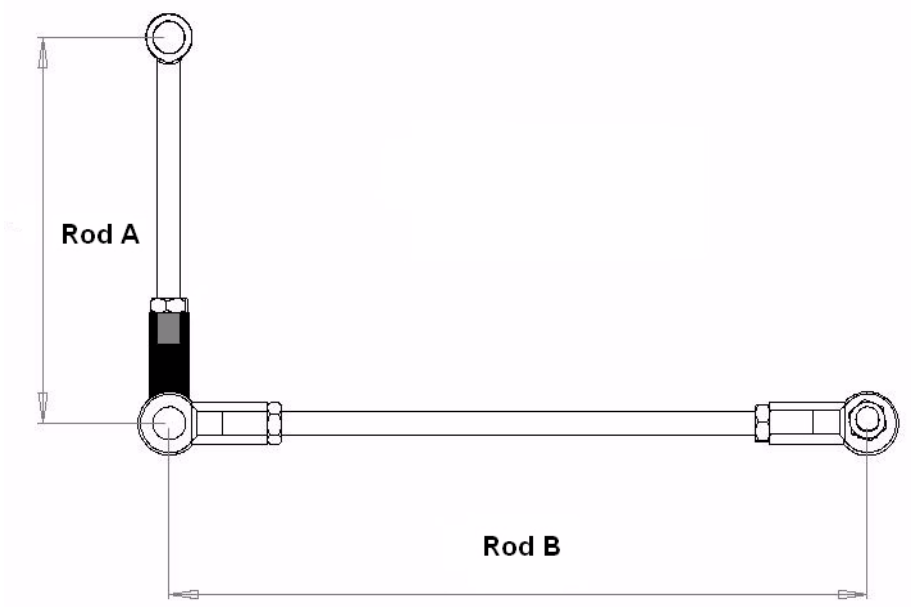


5. For most installations, use *Table 2-2* to adjust the lengths of the rod assemblies to the values shown. *Figure 2-18* shows where the measurement points for each rod are taken. Due to the variation of axle types and installation points, these measurements are provided as a reference only. Before connecting the steering rods and turning the steering axle verify that these lengths will work and the sensor will not be damaged.

Table 2-2 Assembled Linkage Rod Length

Item	Length
Rod A	3.31 inches (84mm)
Rod B	11.14 inches (283mm)

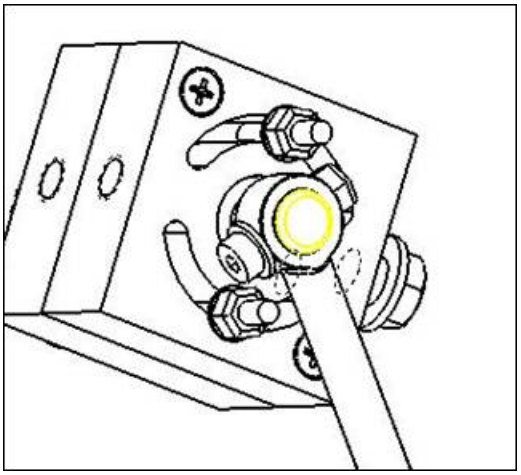
Figure 2-18 Assembled Linkage Rod Measurement Points



Attach the Wheel Angle Sensor Rods to Brackets and Adjust

1. Attach the Wheel Angle Sensor rod to the Wheel Angle Sensor. See *Figure 2-19*.

Figure 2-19 Attach Wheel Angle Sensor Rod to Sensor

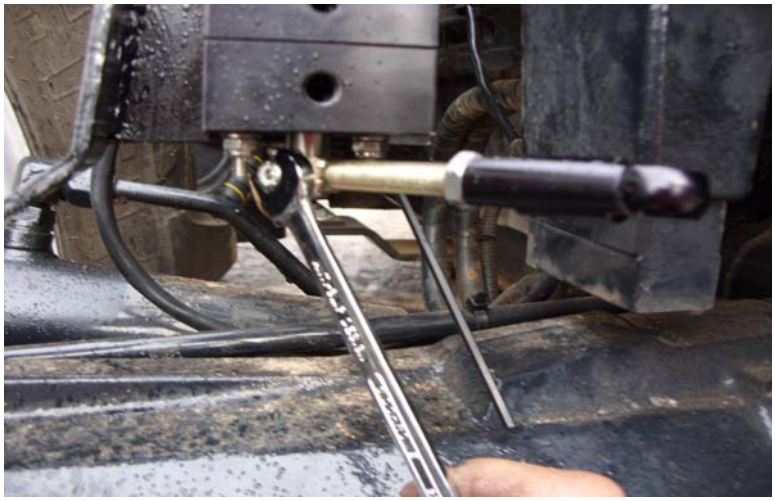


Note: The flat washer goes on the bolt head side and NOT the nut side when attaching the linkage rod. See *Figure 2-20*.

Figure 2-20 Place the Washer on Bolt Head Side

2. Tighten the Wheel Angle Sensor rod with a 3/8” wrench and 1/8” Allen wrench. See *Figure 2-21*.

Figure 2-21 Tighten Wheel Angle Sensor Rod Connection



Note: The rod should aim toward the front of the vehicle.

3. Attach the linkage rod to the linkage bracket and tighten the ball joint to the bracket with a 1/2” and 9/16” wrench. See *Figure 2-22*.

Figure 2-22 Attach Linkage Rod to Linkage Bracket

⚠ WARNING

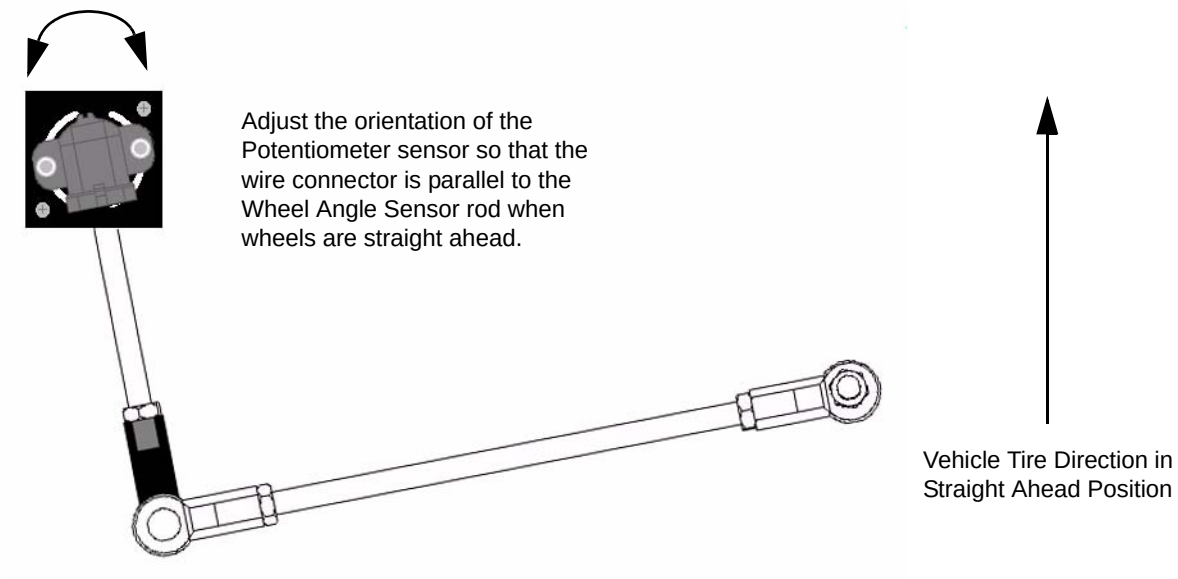
Always shut down the vehicle when working around the steering axle and checking and adjusting the Wheel Angle Sensor rod lengths. The steering axle could move suddenly and cause severe injury or death.

Note: Never attach the linkage rods to Wheel Angle Sensor rod and turn the steering wheels manually or automatically until the fit has been verified. The linkage rods must remain apart while the steering wheels are turned to the maximum right and left positions and then temporarily attached at these positions. Failure to do this may cause the Wheel Angle Sensor or vehicle to become damaged.

Note: After the linkage rods are assembled in the following steps, they should move freely without touching any other parts and without overextending. Make any necessary adjustments to the linkage rods if there is an interference problem.

4. With the linkage rods disconnected, manually turn the steering wheel so that the wheels are centered (the vehicle will travel straight ahead when moving).
5. Temporarily attach the linkage rods.
6. Rotate the Wheel Angle Sensor potentiometer on top of the mounting block so that the plastic wire connector is parallel to the Wheel Angle Sensor rod. See *Figure 2-23*.

Figure 2-23 Adjust Potentiometer Angle to Match Straight Ahead


Adjust the orientation of the Potentiometer sensor so that the wire connector is parallel to the Wheel Angle Sensor rod when wheels are straight ahead.
Vehicle Tire Direction in Straight Ahead Position

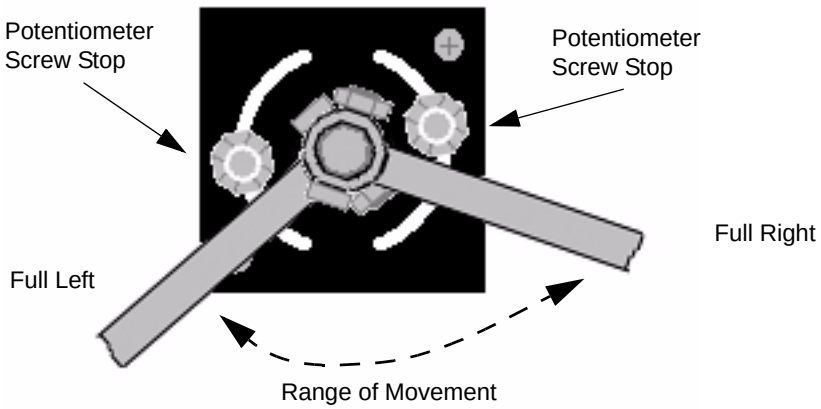
7. After the potentiometer has been adjusted, tighten the potentiometer bolts with a 3/8” wrench and 5/32” Allen wrench.
8. Disconnect the linkage rods and turn the steering wheel manually to the full left position.
9. Reattach the linkage assembly and verify that the sensor or rods will not be damaged. Adjust the rod lengths as necessary. See *Figure 2-24*.

Figure 2-24 Reattaching Linkage Assembly

10. Repeat Step 4 through Step 9 until the rod lengths have been adjusted and the potentiometer is centered to get the maximum sensor movement. The maximum movement is reached when the Wheel Angle Sensor rod will sweep from approximately 3/16 inch (5mm) from both bolt heads holding the potentiometer on to the block when the wheels are turned to the maximum right and left positions. See *Figure 2-25*.

Figure 2-25 Maximum Sensor Movement

Wheel Angle Sensor as Seen from the Bottom



Note: An Ohm meter can also be used to determine if there is enough sensor movement. Connect the Ohm meter to pins A and B of the Wheel Angle Sensor. Measure the Ohm reading at the maximum left and right position. After subtracting the smaller number from the larger number, there should be at least a 3.75 kilohms change. The reading should also never go below 1.6 or higher than 6.6 kilohms as this is reaching the limits of the potentiometer and could damage the sensor.

11. Once all the adjustments are complete, tighten all lock nuts and bolts on the linkage and Wheel Angle Sensor rod. A 1/2" and two 9/16" wrenches are required to tighten all the connections. See *Figure 2-26*.

Figure 2-26 Tighten all Nuts and Bolts

SA Module Installation

The **SA Module Installation** chapter contains information in the following sections:

- *SA Module Mounting Orientation*
- *Mount the SA Module*
  - *Preferred Location*
  - *CVT (Continuously Variable Transmission) Location*
  - *Non-CVT Location*

SA Module Mounting Orientation

The SA Module can also only be mounted in certain orientations. *Figure 3-1* shows the correct mounting positions and *Figure 3-2* shows incorrect mounting positions.

Figure 3-1 Correct SA Module Mounting Orientations

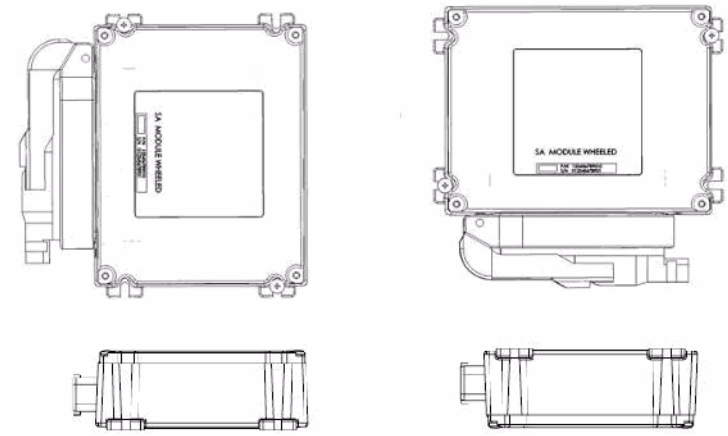
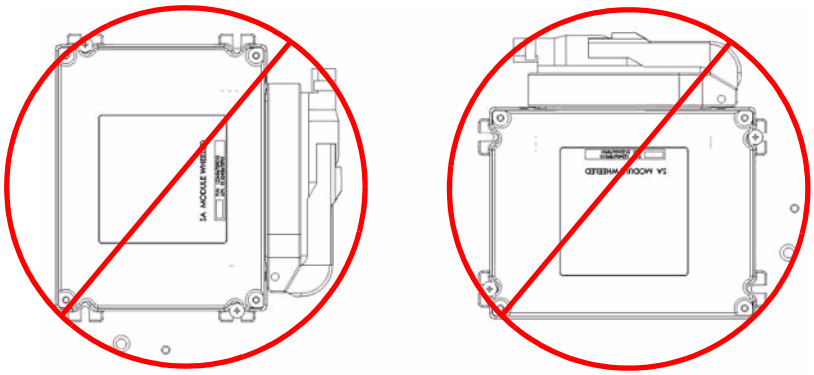


Figure 3-2 Incorrect SA Module Mounting Orientations



Mount the SA Module

Due to the variety of options available on vehicles and the possible configuration differences, it may be necessary to install the SA Module in a location other than the example shown here. If an alternative location is required, choose a location where the SA Module can be protected from damage, from moving parts or crop debris, and excessive moisture from weather and cleaning equipment.

There are three possible mounting locations:

- *Preferred Location*
- *CVT (Continuously Variable Transmission) Location*
- *Non-CVT Location*

Preferred Location

The preferred mounting location is to install the SA Module inside the cab as follows.

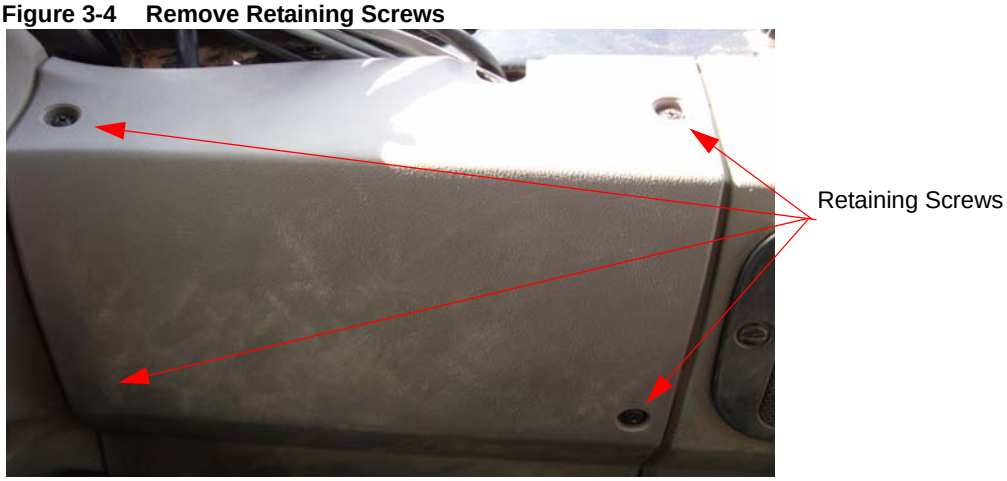
1. Prepare the SA Module Bracket for installation by attaching two screws on the “L” bracket side of the bracket. See *Figure 3-3*.

Note: Do not tighten screws. Allow room for the SA Module to fit beneath them in a later step.

Figure 3-3 Attach Screws to Bracket “L”-side

2. Look inside the cab at the plastic panel behind the seat. Identify the compartment inside the rear of the cab and remove the four retaining screws from the cover. See *Figure 3-4*.

Figure 3-4 Remove Retaining Screws



3. Remove the cover to reveal the space for the SA Module. Attach the SA Module bracket using two 8mm bolts, nuts and washers. Tighten them with a 13mm socket and 13mm wrench. See *Figure 3-5*.

Note: Before trying to install the SA Module, make sure there is enough room; when there are two ECU/modules side-by-side in this space, the SA Module will not fit and you will have to use one of the other locations instead.

Figure 3-5 Attach SA Module Bracket

4. Attach the SA Module Harness to the SA Module. See *Figure 3-6.*

Figure 3-6 Attach SA Module Harness to SA Module

5. Slide the SA Module into place. Mount it by installing the other two screws and tighten all four with a #2 stubby Phillips screwdriver. See *Figure 3-7*.

Figure 3-7 Slide SA Module into Place

6. Replace the compartment cover and tighten the four retaining screws using a #2 stubby Phillips screwdriver. See *Figure 3-4*.

CVT (Continuously Variable Transmission) Location

A second option is to install the SA Module on top of the rear valve as follows.

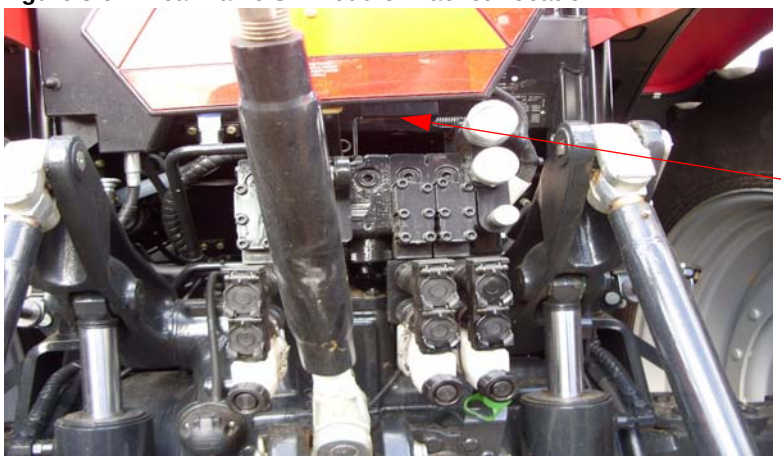
1. Prepare the SA Module Bracket for installation by attaching two screws on the “L” bracket side of the bracket. See *Figure 3-8*.

Note: Do not tighten screws. Allow room for the SA Module to fit beneath them in a later step.

Figure 3-8 Attach Screws to Bracket “L”-side

2. Identify the rear valve area on the back of the vehicle. See *Figure 3-9*.

Figure 3-9 Rear Valve SA Module Bracket Location



3. Cut the cable tie that is retaining rear trailer harness. See *Figure 3-10*.

Figure 3-10 Cut Cable Tie

4. Remove and keep the two bolts from the top of the valve stack using a 10 mm socket. See *Figure 3-11*.

Figure 3-11 Remove Valve Stack Bolts

5. Place the SA Module bracket as shown in *Figure 3-12* and reinstall the bolts you just kept. Tighten with a 10mm socket.

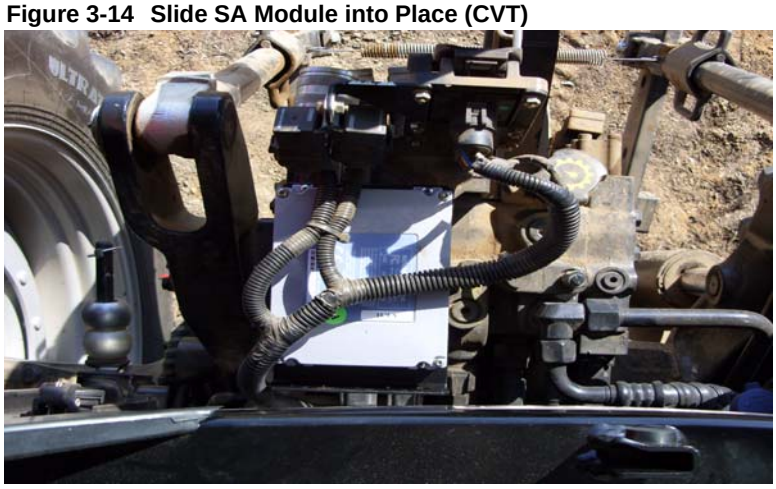
Figure 3-12 Reinstall Valve Stack Bolts

6. Attach the SA Module Harness to the SA Module. See *Figure 3-13*.

Figure 3-13 Attach SA Module Harness to SA Module

7. Slide the SA Module into place. Mount it by installing the other two screws and tighten all four with a #2 stubby Phillips screwdriver. See *Figure 3-14*.

Figure 3-14 Slide SA Module into Place (CVT)



Non-CVT Location

A third option is to install the SA Module on back of the vehicle as follows.

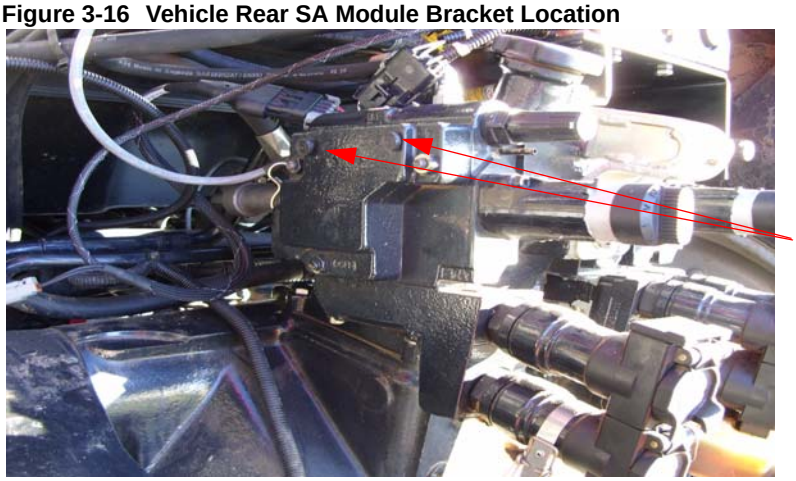
1. Prepare the SA Module Bracket for installation by attaching two screws on the “L” bracket side of the bracket. See *Figure 3-15*.

Note: Do not tighten screws. Allow room for the SA Module to fit beneath them in a later step.

Figure 3-15 Attach Screws to Bracket “L”-side

2. Identify the back of the vehicle. See *Figure 3-16*.

Figure 3-16 Vehicle Rear SA Module Bracket Location



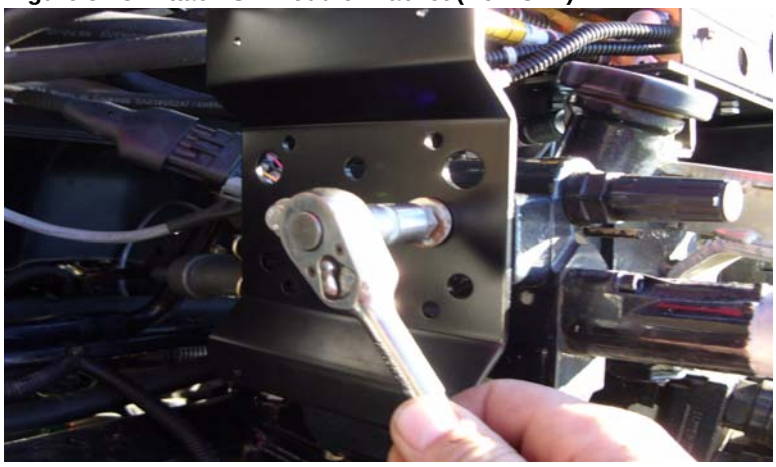
3. Remove the two rubber plugs from the left-hand side of the valve stack. See *Figure 3-17*.

Figure 3-17 Remove Rubber Plugs

4. Attach the SA Module bracket as shown in *Figure 3-18* using two 8mm bolts and washers. Tighten with a 13mm socket.

Note: Two washers can also be placed on each bolt between the bracket and the valve stack to align the bracket into a vertical position.

Figure 3-18 Attach SA Module Bracket (Non-CVT)

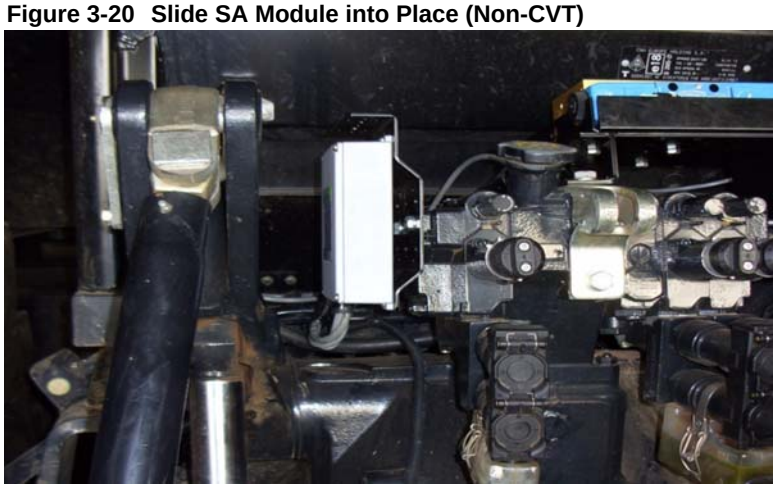


5. Attach the SA Module Harness to the SA Module. See *Figure 3-19*.

Figure 3-19 Attach SA Module Harness to SA Module

6. Slide the SA Module into place. Mount it by installing the other two screws and tighten all four with a #2 Phillips screwdriver. See *Figure 3-20*.

Figure 3-20 Slide SA Module into Place (Non-CVT)



Roof Module Installation

This **Roof Module Installation** chapter contains information in the following sections:

- *Safety Notes*
- *Roof Rail Installation*

Safety Notes

- The AutoSteer system must be powered OFF when installing or removing the Roof Module.
- The Roof Module must always be firmly secured to the Roof Rail using the hardware whenever the vehicle is in operation to prevent the Roof Module from releasing from its bracket and falling.
- The Roof Module must be removed when transporting the vehicle at speeds above 30 mph (48 km/h).
- Ensure you are in a stable position on the vehicle or ladder when removing the Roof Module, so that you do not fall or drop the Roof Module.
- Use a ladder to install the AutoSteer Roof Rail.

WARNING
Ensure that you are in a stable position on the vehicle when installing or removing the Roof Rail and Roof Module so you do not fall.

Roof Rail Installation

1. Place the ladder as close as possible to the side of the cab.

Note: The ladder is necessary to install the Roof Rail and Roof Module.

---

2. Locate the four bolts on the roof cab as shown in *Figure 4-1*.
3. Remove the four bolts with a #2 Phillips screw driver.

Note: The existing bolts will be replaced with longer ones and are no longer needed. Leave the flat washer on top of the rubber gasket.

Figure 4-1 Mounting Bolt Locations

Non Sunroof Models

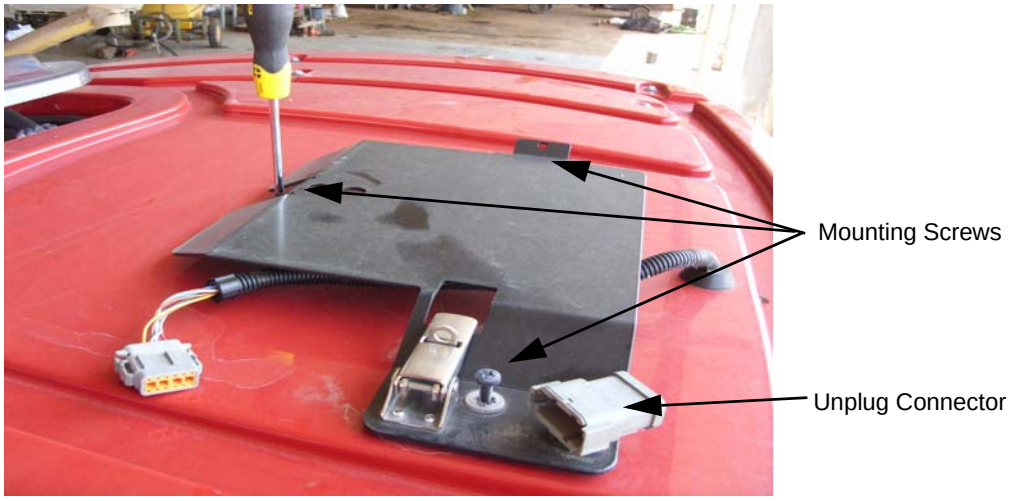
Mounting Bolts

Sunroof Models

Mounting Bolts

4. Remove the three screws and washers retaining the factory roof module GPS receiver mount and unplug the connector as shown in *Figure 4-2*. Remove the bracket and re-install the screws with their washers.

Figure 4-2 Remove Factory Roof Module Mount



5. Install the Roof Rail spacers on top of the existing flat washers. See *Figure 4-3*.

Figure 4-3 Installing the Roof Rail Spacers

6. Place and orient the Roof Rail Brackets as shown in *Figure 4-4*.

Figure 4-4 Orienting the Roof Rail Brackets

Non Sunroof Models

Roof Rail Brackets

Sunroof Models

Roof Rail Brackets

7. Attach the Roof Rail Brackets using the longer bolts and washers supplied. Tighten securely with a 10mm socket and ratchet. See *Figure 4-5*.

Figure 4-5 Attach the Roof Rail Brackets

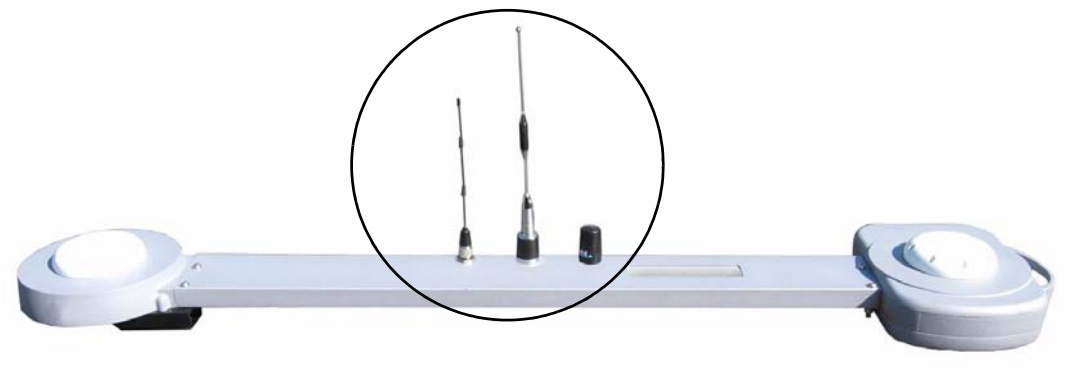
8. Attach the Roof Rail using the bolts, nuts and washers supplied. Tighten securely with a 15/16” socket and ratchet and a 15/16” open wrench. See *Figure 4-6*.

Figure 4-6 Attach the Roof Rail

9. Attach the three antennas to the proper Roof Module antenna connections. See *Figure 4-7*.

Note: Hand tighten the connections. Do not over tighten.

Figure 4-7 Attach the Antennas



10. Remove the Locking Pin from the Roof Rail. See *Figure 4-8*.

Note: Press the button on the end of the handle to allow the pin to be removed.

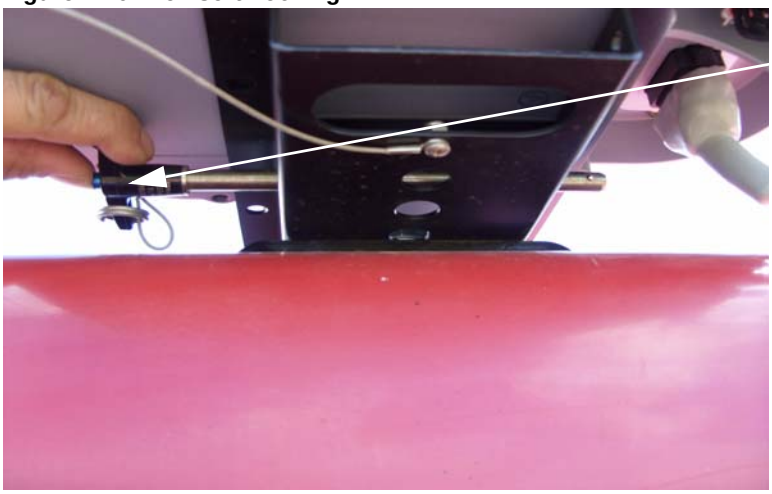
Figure 4-8 Remove Locking Pin

11. Place the Roof Module on the Roof Rail. See *Figure 4-9*.

Figure 4-9 Attach Roof Module

12. Reinsert the Locking Pin into the Roof Rail. See *Figure 4-10*.

Figure 4-10 Reinsert Locking Pin



Note: The Locking Pin can be inserted from either side of the Roof Rail.

13. The completed Roof Module should appear as shown in *Figure 4-11*.

Figure 4-11 Completed Roof Module Installation

Display Installation

This **Display Installation** chapter contains information for installing and adjusting the Display in the following sections:

- *Introduction*
- *Installation Procedure*

Introduction

This manual provides the instructions for installing the RAM Mount Ball in the cab so that the Display can be attached later. Refer to your Display's User Manual for instructions on installing the Display.

Installation Procedure

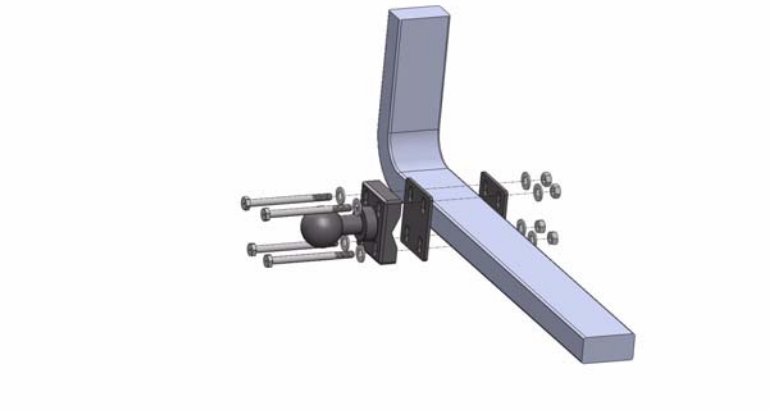
1. Locate the accessory mounting bracket on the right side of the cab. See *Figure 5-1*.

Note: Alternative mounting locations can be used if the location shown is not available.

Figure 5-1 Locate the Accessory Mounting Bracket

2. Insert the four bolts and washers into the RAM Ball and adapter plate, place that combination onto the accessory mounting bracket, and fit the other adapter plate on the back side (loosely fitted with a washer and nyloc nut). The resulting combination is shown in *Figure 5-2*.

Figure 5-2 Position RAM Ball Adaptor Plates on Accessory Mounting Bar



3. Tighten the nuts on the back-side plate evenly using a 10 mm socket and a 10 mm wrench. See *Figure 5-3*.

Figure 5-3 Tighten Nuts on Back Plate

4. Place rubber caps on the end of the bolt threads. See *Figure 5-4*.

Figure 5-4 Place Rubber Caps on Bolt Threads

Note: Refer to the Display User Manual for the remaining Display specific installation instructions.

Connecting System Cables

This **Connecting System Cables** chapter provides information for connecting the Main Cable Harness and the SA Module Cable Harness to the various vehicle and AutoSteer components in the following sections:

- *SA Module Harness*
  - *SA Module Connection*
  - *Wheel Angle Sensor Connection*
  - *Steering Valve Connection*
- *Main Cable Harness*
  - *Roof Module*
  - *Main Cable Harness Connections Inside Cab*
  - *SA Module Harness*
- *Power Supply Connection*
  - *Cab Power Connection*
  - *Battery Power Connection*

SA Module Harness

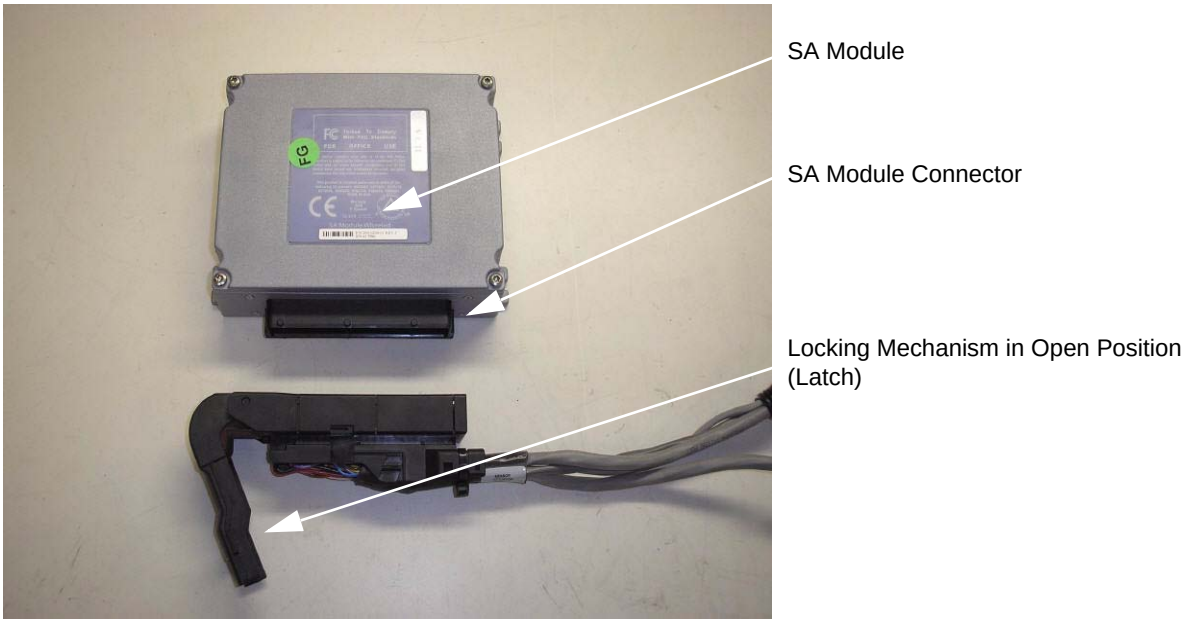
This **SA Module Harness** section contains the following sub-sections:

- *SA Module Connection*
- *Wheel Angle Sensor Connection*
- *Steering Valve Connection*

SA Module Connection

1. Align the SA Module Harness connector to the SA Module. See *Figure 6-1*.
2. Open the connector latch lever. See *Figure 6-1*.

Figure 6-1 Connecting SA Module Connector



3. Press the SA Module Harness connector onto the SA Module connector.

Note: You can damage the connectors if your force them into position. Do not force them together or use tools.

4. Press the latch lever closed until it clicks and locks the connector. See *Figure 6-2*.

Figure 6-2 Closing the SA Module Connector

Note: If you need to disconnect the SA Module connector, you must open the latch lever before attempting to pull the connectors apart.

5. Close the cable connector locking mechanism as shown in *Figure 6-3*.

Figure 6-3 SA Module Connector (closed).

Wheel Angle Sensor Connection

Note: This connection to the Wheel Angle Sensor is only required when using the AutoSteer Wheel Angle Sensor.

1. Route the Wheel Angle Sensor lead under the cab and along the side of the engine to the front axle. Secure with cable ties and connect the Wheel Angle Sensor lead to the Wheel Angle Sensor via adapter cable PN: 201-0482-01. See *Figure 6-4* and *Figure 6-5*.

Figure 6-4 Connecting the Wheel Angle Sensor Adopter

Figure 6-5 Connecting the Wheel Angle Sensor Plug

Steering Valve Connection

1. Locate the Steering Valve connectors on the SA Module Harness, remove the two end caps, and connect the adapter cables. See *Figure 6-6*.

Figure 6-6 Steering Valve Connectors

2. Open the hood of the engine compartment. See *Figure 6-7*.

Figure 6-7 Open Hood

3. Locate the 'Accuguide' steering valve on the Orbitrol and route the valve connections under the cab to this valve. See *Figure 6-8*.

Figure 6-8 Locate Accuguide Steering Valve

4. Separate the three 2-pin connectors on the Steering Valve (see *Figure 6-9*). These three connectors are connected to the hydraulic block on the Orbitrol.

Figure 6-9 Separate the 2-pin Connectors

5. The connectors are labeled: Turn Left, Turn Right, and Isolation as shown in *Figure 6-10*.

Figure 6-10 Connector Labels

6. Connect the SA Module Harness via the adapters to the Steering Valve left and right 'VALVE' connectors by plugging them into the Top (labeled “right”) and the Bottom (labeled “left”) connectors. See *Figure 6-11*.

Figure 6-11 Connecting SA Module and Steering Valve

7. Connect the enable plug into the connector (the one where the plug labeled “Isolation (Manifold)” was removed). See *Figure 6-12*.

Figure 6-12 Connecting the Enable Plug

8. Remove the original 3-pin connector from the side of the Steering Valve and connect the 3-pin pressure transducer cable (labeled “Pressure Sensor”) to the Pressure Transducer in the side of the Steering Valve. See *Figure 6-13*.

Note: The location of this plug can only be accessed from the right-hand side of the tractor.

Figure 6-13 Connecting the Transducer Cable

Main Cable Harness

This Main Cable Harness section contains the following sub-sections:

- *Roof Module*
- *Main Cable Harness Connections Inside Cab*
- *SA Module Harness*

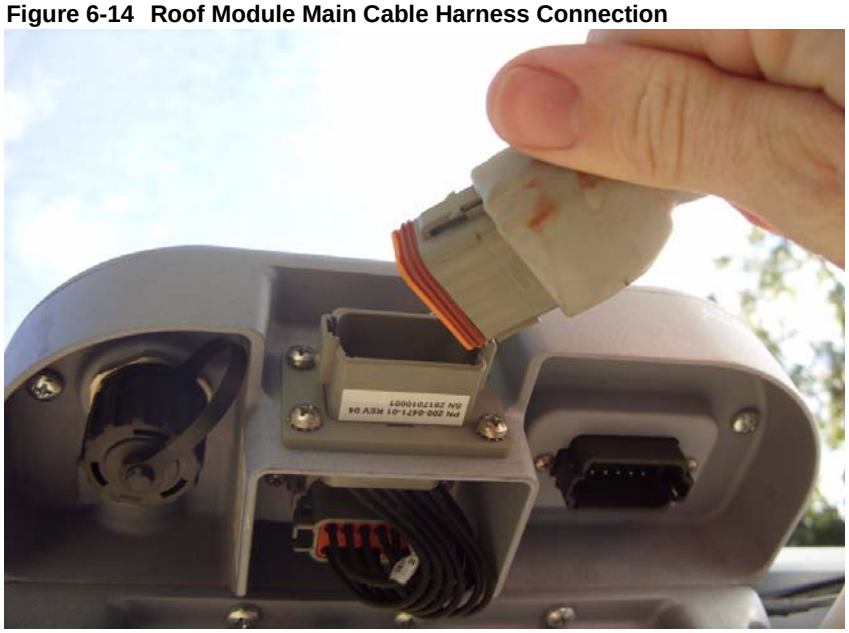
Roof Module

1. Attach the Main Cable Harness to the Roof Module. See *Figure 6-14*.

Orient the 12-pin connector so the word “TOP” on the cable connector is pointing upwards (towards the sky). Insert the cable connector into the Roof Module. Push the connector in until it “clicks” and locks in place. To remove, grasp the connector to compress the two side latches and pull away from the Roof Module.

Note: Do not force the connector. If the connector does not engage easily, check for the correct orientation of the connector.

Figure 6-14 Roof Module Main Cable Harness Connection



2. Attach the LAN connector to the Roof Module. See *Figure 6-15*.

Orient the Ethernet cable connector with the connector under the receiver so the contacts on the cable connector are pointing towards the back of the vehicle. (This will usually be towards your right side if you are standing on the left side of the vehicle and looking towards the Roof Module.) Slide the cable connector into the receiver and rotate the plastic bayonet sleeve clockwise to lock the connector. The bayonet sleeve will “click” when it fully engages and locks. To remove the cable, rotate the bayonet sleeve counterclockwise until it “clicks” and pull the connector down or away from the Roof Module.

Note: Do not force the connector. If the connector does not engage easily, check for the correct orientation of the connector.

Figure 6-15 Roof Module Ethernet Connection

3. Route the Main Cable Harness down the right side of the cab, across the back of the cab, and into a grommet which allows access into the cab. See *Figure 6-16*.

Note: This may require cutting a slot in the rubber grommet to allow the wires to pass through.

Figure 6-16 Routing the SA Module Cable into the Cab

Main Cable Harness Connections Inside Cab

Figure 6-17 shows the Main Cable Harness connections used inside the cab. *Table 6-1* shows the functions of the Main Cable Harness cab connectors. Refer to your Display's User Manual for instructions on connecting the Main Cable Harness connections shown to the correct ports and harnesses on the Display and Display cables.

Figure 6-17 Main Cable Harness Cab Connections

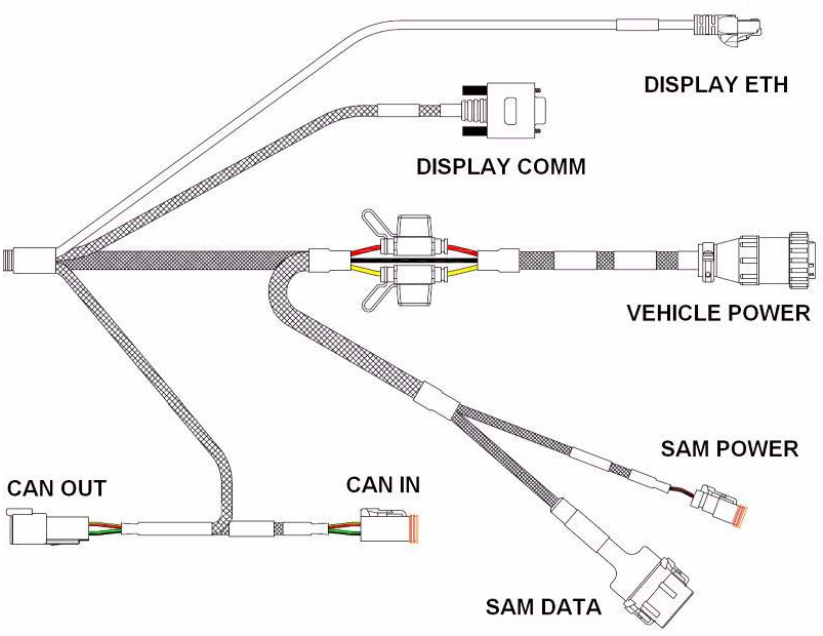


Table 6-1 Cab Main Cable Harness Connector Functions

Main Cable Harness Connector	Connector Function
DISPLAY ETH	Display Ethernet Port (RJ-45)
DISPLAY COMM	Display Communication Port (DB-9)
VEHICLE POWER	12 Volt Power Supplied by Display Harness
SAM POWER	Power for SA Module
SAM DATA	Data for SA Module
CAN IN	Not Used for This Installation
CAN OUT	Not Used for This Installation

SA Module Harness

1. Connect the 12-pin data and 2-pin power connectors between the Main Cable Harness and the SA Module Harness. See *Figure 6-18*.

Figure 6-18 Connect Main Cable and SA Module Harnesses

Power Supply Connection

The following sub-sections describe basic instructions for connecting the AutoSteer system to available vehicle power sources:

- *Cab Power Connection*
- *Battery Power Connection*

Note: Refer to your Display user manual before connecting the AutoSteer system to vehicle power.

The Main Cable Harness must be connected to a 3-pin 12V power source. Your Display user manual provides specific instructions for connecting power to the AutoSteer system and specifies the appropriate vehicle power source.

Cab Power Connection

1. Locate the cab console right-side 12V power outlet. See *Figure 6-19*.
2. Use this 12V accessory power connector if the Display user manual specifies connecting to power inside the cab and connect the power to the three-pin socket in the cab using the supplied adapter cable.

Figure 6-19 Power Outlet Inside Cab

Battery Power Connection

1. Locate the vehicle battery on the right-hand side of the cab behind the steps. See *Figure 6-20*.
2. Connect to the vehicle battery if the display manual specifies a direct battery connection.

Figure 6-20 Battery Location

Note: A battery cable is provided with the AutoSteer system when a direct battery connection is required.

Post-Installation Procedures and Information

The **Post-Installation Procedures and Information** chapter provides information in the following sections:

- *Create New Vehicle*
- *Calibration and Tuning Guidelines*

Once the entire AutoSteer system, including the Display and display harnesses, have been installed on the vehicle, the procedures and notes provided in this chapter must be followed to complete the installation and prepare the vehicle for full AutoSteer capabilities.

Create New Vehicle

Once the entire system has been installed, the operator must first create a new vehicle profile. This configures the system so the User display can properly communicate with the various sensors and components on the vehicle. Follow the procedure below to create a new vehicle.

1. Make sure the User display is not powered ON.
2. Start the vehicle and take it to a clear area (such as an open field) where it can be calibrated.
3. Power up the AutoSteer system.
4. Follow the instructions provided in the Display's user manual to create a new vehicle.

Calibration and Tuning Guidelines

Note: For optimal steering performance, the AutoSteer system must be fully calibrated and then tuned.

Final Hardware Installation Checklist

This **Final Checklist** chapter contains the verifications steps necessary after the installation of the AutoSteer system.

Note: The Final Hardware Installation Checklist is on the back of this page. Tear this page out of your manual and fill in the checklist after the installation. You should keep a copy of this checklist for future reference when servicing the vehicle.

Machine Model: _____ Year: _____ Serial #: _____

Customer Name: _____

Location/Address: _____

AutoSteer Installation Kit Part Number: _____

NOTES

_____

_____

_____

_____

_____

_____

Name of Installer: _____ Date: _____

System Installation Checklist

1. Wheel Angle Sensor installed and all fasteners are tight. (optional) ☐
2. Display Bracket installed and all fasteners are tight. ☐
3. Roof Rail is installed and all fasteners are tight. ☐
4. SA Module is installed and all fasteners are tight. ☐
5. All cable ends are connected. ☐
6. All cables are secured with cable ties. ☐

AutoSteer Performance Checklist

1. Complete AutoSteer system calibration. ☐
2. Complete AutoSteer system tuning. ☐
3. Check total Wheel Angle Sensor counts. ☐ Value_____
4. Line acquisition is satisfactory. ☐
5. On-line steering is satisfactory. ☐
6. Manual override (kick-out) is working. ☐
7. Steering speed from lock-to-lock is satisfactory. ☐ Value_____Sec.

Note: See the *Post-Installation Procedures and Information* chapter for additional information.